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ABSTRACT

This study was designed to identify differences in the neurological functioning of three groups of children with developmental dyslexia and to assess whether any of the groups were characterized by a particular pattern of neurological soft signs. Subjects were 88 children, aged 11-14, who were identified as developmentally dyslexic. The children were administered the Boder Test of Reading-Spelling Patterns (BTRSP) and the Quick Neurological Screening Test (QNST). The children were then cross-classified into three subtypes of reading-spelling patterns (dysphonetic, dyseidetic, and mixed) and three levels of neurological functioning (normal, suspicious, and highly suspicious) according to the criteria established by the BTRSP and the QNST. Scores on the BTRSP were not associated with those on the QNST. No significant differences were found among the three groups on either individual subtest patterns or overall neurological functioning. The results do not appear to indicate that reading disability subtypes can be differentiated by the QNST. (Author/JDD)

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Differentiating Levels of Neurological Impairment in Children with Developmental Dyslexia

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ABSTRACT

This study was designed to determine whether there are differences in the neurological functioning of three groups of children with developmental dyslexia (N=88) and to assess whether any of the groups are characterized by a particular pattern of neurological soft signs. Scores on the Boder Test of Reading-Spelling Patterns (BTRSP) were not associated with those obtained on the Quick Neurological Screening Test (QNST). No significant differences were found between the three groups on either individual subtest patterns or overall neurological functioning. The results do not appear to indicate that reading disability subtypes can be differentiated by the QNST.

Differentiating Levels of Neurological Impairment
in Children with Developmental Dyslexia

The relationship between neurological functioning and reading impairment has been a topic of interest for many years. Although many researchers contend that this relationship cannot be substantiated, others report that they have been able to delineate a number of neurological variables that distinguish disabled readers from normal readers. Differentiating specific subtypes of disabled readers on the basis of their neurological functioning, however, is a more recent endeavor. Research findings have been less conclusive in this area and primarily have been conducted with laboratory measures (Aylward, 1984; Dalby & Gibson, 1981; Fried, 1979, Fried, Tanguay, Boder, Doubleday & Greensite, 1981; Malatesha & Dougan, 1982; Menkin, 1981; Obrzut, 1979; Rosenthal, Boder & Calloway, 1982).

This study used two standardized procedures readily available to the school or clinical psychologist to determine whether there were differences in the neurological functioning of three groups of children identified as experiencing developmental dyslexia and whether these groups were characterized by any particular cluster of soft signs. The Boder Test of Reading-Spelling Patterns (BTRSP), presented by Boder and Jarrico in 1982, continues to be the only standardized method for differentiating subtypes of developmental dyslexia. The Quick Neurological Screening Test (QNST), first presented by Mutti, Sterling and Spalding in 1978, was the only systematic procedure for overall neurological screening available at the time of the study to the school or clinical psychologist untrained in neuropsychological assessment.

The subjects for this study were 88 children, aged 11-14, who were identified as developmentally dyslexic according to criteria established by the BTRSP. Current IQ, age, grade, and number of years in LD instruction were obtained from the child's cumulative school record. There were no significant differences found between the subtype groups on any of the demographic variables.

Individual testing sessions were scheduled with the children who met the initial criteria for the study (e.g., IQ = 80 or above). Each child was then administered the Boder Test of Reading-Spelling Patterns. If the child met the BTRSP criteria for developmental dyslexia then the Quick Neurological Screening Test was administered.

The children were then cross classified into three subtypes of reading-spelling patterns (dysphonetic, dyseidetic, and mixed dysphonetic-dyseidetic) and three levels of neurological functioning (normal, suspicious, and highly suspicious) according to the criteria established by the BTRSP and the QNST. The chi square test of independence was utilized to explore whether the classification methods used by the BTRSP and the QNST were associated.

Following this analysis, the overall neurological functioning of the three subtypes of reading-spelling patterns was investigated by comparing subtype means on the QNST. The average number of QNST subtests scoring above a cut off point associated with the suspicion of neurological dysfunction for each BTRSP subtype were also compared. Analysis of variance procedures were used to make these comparisons. The data was analysed using a .05 level of significance.

Results of the Chi Square Analysis
BTRSP Subtype X QNST Classification

BTRSP	QNST classification Normal	Suspicious	High	Total
Dysphonetic				
frequency	16	25	5	46
row percent	34.78	54.35	10.87	52.27
Dyseidetic				
frequency	1	3	1	5
row percent	20.00	60.00	20.00	5.68
Mixed				
frequency	11	22	4	37
row percent	29.73	59.46	10.81	42.05
Total	28	50	10	N= 88
	31.82	56.82	11.36	

Chi Square = .849 df = 4

The chi square test of independence found that the two methods of categorization were not associated. In addition, no significant differences were found between the BTRSP subtypes on QNST total raw scores, selected QNST subtest raw scores or on number of QNST subtests demonstrating suspicious to highly suspicious levels of neurological dysfunction.

It appears that neurological soft signs, as measured by the QNST, are of questionable value in delineating subtypes of dyslexia. Even though each child involved in the study experienced soft signs to some degree, no relationship to reading difficulties was found. Although soft signs have long been considered to be in some way associated with neurological dysfunction and cognitive impairment, this association, if it does exist, continues to be poorly understood.

Even though the BTRSP is based upon neurological principles, it is conceivable that the BTRSP subtypes are not due to neurological deficits but

to other factors. A number of researchers contend that many reading problems may not be associated with neurological deficits and may be due to poor motivation, inadequate educational experience, or emotional disturbance.

The results of this study indicate that both the BTRSP and the QNST must be used with caution. The classification systems employed by both tests do not appear to be sufficiently refined to adequately describe reading disabled children or contribute to the development of individualized treatment programs for such children.

The relationship between reading problems and neurological dysfunction must also be seriously considered and other environmental or academic factors not summarily ruled out in favor of the neuropsychological model. In addition, the overall use of neurological soft signs as diagnostic indicators or for treatment planning must be questioned. Even though all of the children in this study displayed soft signs to varying degrees, it was apparent that this observation was not associated with their reading impairment or overall neurological functioning.

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